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International association for obtaining a uniform...

Report on the unit of length

[S.l.]

[1858?]

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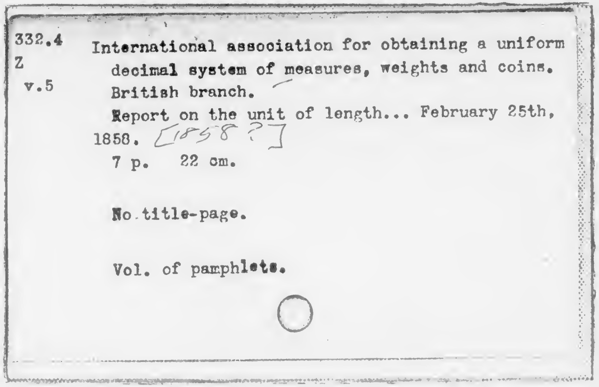

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International association for obtaining a uniform decimal system of measures, weights and coins. British branch.

Report on the unit of length... February 25th, 1858. [1858?]

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INTERNATIONAL ASSOCIATION

FOR OBTAINING A

UNIFORM DECIMAL SYSTEM OF MEASURES, WEIGHTS, AND COINS.

British Branch.

REPORT ON THE UNIT OF LENGTH,

Presented by the Council to the Second Annual General Meeting, held February 25th, 1858.

At the First Annual General Meeting, held February 26th, 1857, the following Resolutions were adopted:

"That this Meeting regards as the first essential step towards arriving at a Uniform System of Measures, Weights, and Coins, which shall be International as well as Decimal, the adoption of the Best Units of Length and of Weight.

"That the Council be requested to make inquiries and to collect information on these two subjects, with a view to the attainment of useful, definite, and practical results.

"And that, if the Council and the Members of the British Branch Association in general, are able to arrive at a conclusion on either of these points, they be authorized to request the General Officers of the Association to summon a Fourth General Meeting of the Central Association, and to obtain for it the concurrence of Her Majesty's Government and of the principal

> commercial nations of the world; and that the object of this General Meeting be to consider the adoption of any plan, which may be recommended either by this Branch Association or by those of other countries."

In order to comply with this request, a set of questions was printed and circulated, with a view to obtain all desirable information relative to the BEST UNIT OF LENGTH, the question of the Unit of Weight being postponed until the preliminary inquiry had been finished.

A considerable number of answers were received; and as soon as the Council were able to reduce their deliberations and researches to a sufficiently definite form, they proceeded to call Meetings of the Members of the Association resident in London, and invited to these Meetings all persons who were known to be friendly to the general objects of the Association, and who were supposed to be interested in the subject and able to give valuable advice. Hence, both by letters received, and by the kind personal attendance of various gentlemen of scientific eminence and great practical experience, the Council have been enabled to arrive at a conclusion, which they can with full confidence recommend to the general body of the Association.

The first question was, whether they should adopt some new Unit, or fix upon a Unit already in use. No less than thirteen new Units, suggested either in published works or in letters to Members of the Council, came under review, in general evincing great ingenuity, diligence, and research, on the part of their inventors. It did not however appear, that any one of these had ever been applied in practice. The Council therefore decided to recommend some Unit, which was already in use, and which might be the best adapted to promote the general reception and permanent establishment of a uniform Decimal and International System.

On similar grounds they find themselves obliged to pass over the second's pendulum, the claims of which to preference were fully discussed. Notwithstanding the numerous experiments made in different parts of the globe by philosophers of the highest ability, the exact length of the second's pendulum either under the Equator, or in any latitude N. or S. of the Equator, is still undetermined; nor does it appear that, since the proposal of Mr. Locke in 1679 to use the third part of the length of a reputed second's pendulum as a unit of linear measure, it has ever been adopted by any one for this purpose. No pendulum now exists which is proved and generally supposed to beat seconds with the requisite accuracy.

In consequence of the real or presumed relation of the linear measures of all ages and nations to the dimensions of the human body, the Council thought it right to inquire, what influence this consideration ought to have on their decision. Although they did not deem it advisable to fix upon the length or circuit of any portion of the human body, they adopted conclusions distinctly referring to its structure and functions. They thought it eminently desirable, that the Unit should be of such a length as might be adapted to measure the greatest variety of objects, and in the most numerous cases, which are likely to occur in daily life; that it should be visible at a glance of the eye, and easily carried about and manipulated by those who use it. It appeared that for these purposes an inch or a foot, much more any subdivision of these quantities, would be too short; that a fathom would be too long; but that the required conditions would be best fulfilled by any measure about the same with the ell, the metre, the second's pendulum, or the yard.

In relation to another much-controverted subject, the Council thought it requisite, in conformity with the aim of an International Association, to avoid the appearance of undue partiality to English habits, and that a natural standard, adapted as far as possible to the ideas of all countries throughout the world, ought to be preferred to any, which has been employed from merely traditional, arbitrary, or accidental causes. Indeed, it appeared that, even if the English yard were chosen, very little benefit would ensue, because no decimal multiples or divisions of the yard are anywhere in use, and consequently a set of linear measures must be devised entirely new, with the single exception of the yard itself.

The Council were thus brought of necessity to the special consideration of the claims of the metre.

They first examined at length the objections to the metre on the ground of its supposed inaccuracy. They found that some of these objections are entirely without foundation, and that others are insufficient to justify its rejection. The advance of science, the improvements in astronomical instruments, and the repetition of attempts to measure meridians, although they may lead to some very minute alterations in the length of the metre, or in its assigned standard temperature, tend on the whole to establish its accuracy. It is impossible to measure with perfect exactness any material object. We ought to aim at the utmost attainable perfection, but still to allow a degree of latitude, so that a measurement may not be condemned because it may possibly differ by the hundred thousandth part from the real truth.

The attention of the Council was also called to certain alleged defects in the construction and preservation of THE METRE, meaning hereby the bar of platinum, which became the prototype in 1799, and which is still preserved in its original depositary at Paris. It is hoped that, if the metre is finally adopted by this country as its unit of length, provision will be made for the due correction of any minute, accidental, or unintentional defects.

The Council are of opinion, that, if by any accident the prototype shall be lost or destroyed, the metre may be restored without difficulty, not by a new measurement of a meridian, but by a reference to the numerous authorized copies dispersed over the world.

On proceeding to consider the metre with more especial reference to practice, the Council found that the metre has every quality which can be desired in a unit, which is to be employed as the basis of a Decimal and International System.

Its binary divisions go as far as can ever be wanted. Its subdivisions and its multiples are superior in utility and ease of application to those of any other system throughout the world.

Hence it is not surprising that the metre has made a remarkably rapid and extensive progress, being already adopted by about sixteen nations of greater or less commercial importance in both hemispheres. It appears, also, that the use of it is sanctioned by law in this country; that it is gradually becoming more known and appreciated; and that it has already come into use for a variety of purposes.

On the whole, the Council conclude, that its adoption is advisable, not only as the means of securing great political, social, and commercial advantages to the United Kingdom, but as a demonstration of a becoming desire to co-operate with other enlightened and powerful nations in the accomplishment of a generous design, which is urged upon public attention by the strongest appeals of reason and science, of patriotism and of philanthropy.

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